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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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Mark B. Wilsjon
FULBRIGHT & JAWORSKI L.L.P.
Suite 2400
600 Congress Avenue
Austin, TX 78701

EXAMINER	
FORD, VANESSA L	
ART UNIT	**PAPER NUMBER**
1645	

DATE MAILED: 11/10/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/023,437	JOHNSTON ET AL.	
	Examiner	Art Unit	
	Vanessa L. Ford	1645	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *12 August 2004*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *25-61 and 74-83* is/are pending in the application.

4a) Of the above claim(s) *26-38,47-61 and 76-81* is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *25,39-46,74,75,82 and 83* is/are rejected.

7)☐ Claim(s) _____ is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☒ The drawing(s) filed on *17 December 2001* is/are: a)☒ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☐ All b)☐ Some * c)☐ None of:

1.☐ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date *4/2/02 & 5/19/03*.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

1. Applicant's election with traverse of Group I, claims 25, 33, 39-51, 74-75 and 82 and species election, *Chlamydia psittaci* and species election, SEQ ID NO:13 filed April 14, 2004 in response to the Restriction required mailed August 12, 2004 are acknowledged. Claims 1-24 and 62-73 have been cancelled. Claims 25 and 42 have been amended. Claim 83 has been added. Claims 26-38, 47-61 and 76-81 are withdrawn from further consideration by the examiner, 37 CFR 1.142(b), as being drawn to a non-elected invention. Claims 25, 39-46, 74-75 and 82-83 are under examination.

The traversal was on the grounds that Groups I and II are generically linked by claim 25. Applicant urges that all Group I and II claims include the limitations of claim 25. Applicant urges that the presence of a generic linking claim should be stated in the record. Applicant urges that all claims should be examined. Applicant urges that they presently take and have no position as to whether Group I and II are patentably distinct and the traversal is based solely on the linking claim and the MPEP requirements for linking claims.

These arguments have been fully considered but are not found to be persuasive. Group I is drawn to a method of immunizing an animal comprising administering to the animal a *Chlamydia* antigen or fragment thereof. Group II is drawn to a method of immunizing an animal comprising administering to the animal a *Chlamydia* DNA molecule or fragment thereof. Groups I and II are drawn to different methods which require different method steps, parameters and endpoints. Clearly different searches and issues are involved in the examination of each Group.

The MPEP 803 states that restriction is proper between patentably distinct inventions where the inventions are (1) independent or distinct as claimed and (2) a serious search and examination burden is placed on the examiner if restriction is not required. The term "distinct" is defined to mean that two or more subjects as disclosed are related, for example as product and method of use, etc., but are capable of separate manufacture, use or sale as claimed, and are patentable over each other (see MPEP 802.01). In the instant situation, the inventions of Groups I and II are drawn to distinct inventions which are separate products and methods capable of separate manufacture, use or sale as described in the previous Office Action.

Classification of the subject matter is merely one indication of the burdensome nature of the search. The literature search, particularly relevant in this art, is not co-extensive because Group I is directed to administering *Chlamydia* antigen and Group II is directed to administering *Chlamydia* DNA. For these reasons the restriction between Groups I and II is deemed to be proper and is therefore made FINAL.

In view of Applicant's arguments and comments regarding election of SEQ ID Nos. to be examined, after consideration and review it is the Examiner's position that SEQ ID NOs. 7, 9, 11 and 13 will be examined in this application.

Claim Objection

2. Claim 40 and 41 are objected to because they depend from a succeeding claim.

Correction is requested.

Claim Rejections - 35 USC § 112

The following is a quotation of the first paragraph of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

3. Claims 25, 39-46, 74-75 and 82-83 are rejected under 35 U.S.C. 112, first paragraph, because the specification, while being enabling for a method of immunizing an animal comprising providing to the animal; at least one *Chlamydia* antigen corresponding to SEQ ID No. 9 or SEQ ID No. 7 and further comprising a second *Chlamydia* antigen corresponding to SEQ ID No. 11 or SEQ ID No. 13 does not reasonably provide enablement for all antigenic fragments of the SEQ ID Nos. 7, 9, 11 or 13 encompassed by the claims that can be used in the claimed method. The specification does not enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the invention commensurate in scope with these claims.

The specification teaches that the term "fragment " is defined as a sequence having at least 5 or more contiguous residues but less than the full-length of the SEQ ID

Nos. (page 13). The specification teaches that it is contemplated that the definition of "fragment" can be applied to amino acid as well as nucleic acid fragments (page 13). The specification refers to the "antigenic fragment" as a fragment that can elicit an immune response in an animal (page 13).

The specification has failed to provide a structure for all of the antigenic fragments encompassed by the claimed invention.

The scope of the claims is not commensurate with the enablement provided by the disclosure with regard to the extremely large number of proteins broadly encompassed by the claims and the claims broadly encompass a significant number of inoperative species. Since the amino acid sequence of the protein determines its structural and functional properties, predictability of which changes can be tolerated in a protein's amino acid sequence and still retain similar activity requires a knowledge with regard to which amino acids in the protein's sequence, if any, are tolerant of modification and which are conserved (i.e. expected intolerant to modification) and detailed knowledge of the ways in which the protein's structure relates to function. However, the problem of the prediction of protein's structure from mere sequence data of a single protein and in turn utilizing predicted structural determinations to ascertain functional aspects of the protein and finally what changes can be tolerated with respect thereto is extremely complex and outside of the realm of routine experimentation.

While recombinant and mutagenesis techniques are known, it is not routine in the art to screen multiple substitutions or multiple modifications of other types and the positions within the protein's sequence where amino acid modifications can be made

with a reasonable expectation of success in obtaining similar activity are limited in any polynucleotide and the result of such modifications is unpredictable based on the instant disclosure. One skilled in the art would expect any tolerance to modifications. The sequence of some proteins is highly conserved and one skilled in the art would not expect tolerance to any amino acid modification in such protein.

Thomas E. Creighton, in his book, *"Proteins: Structures and Molecular Properties, 1984"*, (page 315) teaches that variation of the primary structure of a protein can result in an instable molecule. He teaches that a single amino acid change can cause a mutant hemoglobin to have lower stabilities due to any of several causes: 1) alteration of close-packing of the interior; loss of one group that normally participates in a hydrogen bond or salt bridge; 2) the introduction of a charged or polar group into the interior or the insertion into a helical region of a proline residue, which must distort the alpha-helix; 3) while sometimes radical changes of surface groups, even introduction of a non-polar side chain- have no great effect on stability.

Thomas E. Creighton, in his book *"Protein Structure: A Practical Approach, 1989; pages 184-186"* teaches that present day site directed mutagenesis of a gene allows any amino acids in a protein sequence to be changed to any other, as well as introducing deletions and insertions". The reference goes on to teach that it is difficult to know which amino acid to change and which is the best residue to substitute for the desired functional and structural effect.

Nosoh, Y. et al in *"Protein Stability and Stabilization through Protein Engineering, 1991"* (chapter 7, page 197, second paragraph) adds support to Thomas E. Creighton,

by teaching that results so far accumulated on the stability and stabilization of proteins appear to indicate that the strategy for stabilizing proteins differ from protein to protein and that any generalized mechanisms for protein stability have not yet been presented.

There is no guidance provided in the specification as how one would begin to choose all "antigenic fragments" of SEQ ID NOs. 7, 9, 11 or 13 encompassed by the claims. The specification does not support the broad scope of the claims, which encompass all modifications and fragments because the specification does not disclose the following:

- the general tolerance to modification and extent of such tolerance;
- specific positions and regions of sequence(s) which can be predictably modified and which regions are critical;
- what fragments, if any, can be made which the retain the biological activity if the intact protein; and
- the specification provide essentially no guidance as to which of the essentially infinite possible choice is likely to be successful.

Factors to be considered in determining whether undue experimentation is required are set forth in In re Wands 8 USPQ2d 1400. They include (1) the quantity of experimentation necessary, (2) the amount of direction or guidance presented, (3) the presence or absence of working examples, (4) the nature of the invention, (5) the state of the prior art, (6) the relative skill of those in the art, (7) the predictability or unpredictability of the art and (8) the breadth of the claims.

Applying the above test to the facts of record, it is determined that 1) no declaration under 37 C.F.R. 1.132 or other relevant evidence has been made of record establishing the amount of experimentation necessary, 2) insufficient direction or guidance is presented in the specification with respect to selecting other proteins having claimed functional features, 3) the relative skill of those in the art is commonly recognized as quite high (post-doctoral level). One of skill in the art would require guidance, in order to make or use proteins all antigenic fragments of SEQ ID Nos. SEQ ID Nos. 7, 9, 11 or 13 in manner reasonable in correlation with the scope of the claims. Without proper guidance, the experimentation is undue.

The Applicant has not provided sufficient guidance to enable one of skill in the art to make and use the claimed invention in a manner reasonably correlated with the scope of the claims broadly including any number of deletions or substitutions and fragments of any size. The scope of the claims must bear a reasonable correlation with the scope of enablement (In re Fisher, 166 USPQ 19 24 (CCPA 1970). Without such guidance, the changes which can be made in the amino acid's structure and still maintain activity is unpredictable and the experimentation left those skilled in the art is unnecessarily and improperly, extensive and undue. See Amgen Inc v Chugai Pharmaceutical Co Ltd. 927 F 2d 1200, 18 USPQ2d 1016 (Fed. Cir. 1991) at 18 USPQ2d 1026-1027 and Exparte Forman, 230 U.S. P.Q. 546(Bd. Pat=. App & int. 1986).

The following is a quotation of the second paragraph of 35 U.S.C. 112:

> The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

4. Claims 25, 39-46, 74-75 and 82-83 are indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention. Claim 25 recites "providing to the animal". It is not clear as to what Applicant is referring. Does Applicant mean that the *Chlamydia* antigen is administered to the animal? The language of the claims is not as precise as the subject matter permits such that one would reasonably know the metes and bounds of the claimed subject matter. Correction is required.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
>
> (e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2)

5. Claims 25, 39-43, 45-46, 74-75 and 82-83 are rejected under 35 U.S.C. 102(e) as anticipated by Griffais et al *(U.S. Patent No. 6,559, 294 B1 published May 6, 2003).*

Claims 25, 39-43, 45-46, 74-75 and 82-83 are drawn to a method of immunizing an animal comprising providing to the animal at least one *Chlamydia* antigen or antigenic fragment thereof in an amount effective to induce an immune response.

Griffais et al teach a method of immunizing an animal comprising administering vaccine compositions comprising at least one *Chlamydia* antigen or antigenic fragment in an amount to induce an immune response (columns 62-64). Graffais et al teach that the vaccine composition are administered to a mammalian host (column 62) including humans (column 63). Griffais et al teach that any number of antigens may be included in the invention (see Table 1). Griffais et al teach that antigen from *Chlamydia psittaci* may be included in the invention. Therefore, the prior art meets the claim limitation "...wherein the method is effective to induce an immune response against *Chlamydia psittaci".* The prior art teaches antigenic fragments of SEQ ID Nos. 7 and 9 (corresponding to the first *Chlamydia* antigen) as well as antigenic fragments of SEQ ID Nos. 13 (corresponding to the second *Chlamydia* antigen). SEQ ID NO: 59 of the prior art corresponds to fragments of SEQ ID NOs: 7 and 9. SEQ ID NO: 12 of the prior art corresponds to antigenic fragments of SEQ ID NO:13. See the attached sequence alignments.

Since the Office does not have the facilities for examining and comparing applicant's method with the method of the prior art, the burden is on the applicant to

show a novel or unobvious difference between the claimed method and the method of the prior art (i.e., that the method of the prior art does not possess the same material method steps and parameters of the claimed method). See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

6. Claims 25, 39-43, 45-46, 74-75 and 82-83 are rejected under 35 U.S.C. 102(b) as anticipated by Griffais et al *(WO 9927105 A2 published June 10, 1999)*.

Claims 25, 39-43, 45-46, 74-75 and 82-83 are drawn to a method of immunizing an animal comprising providing to the animal at least one *Chlamydia* antigen or antigenic fragment thereof in an amount effective to induce an immune response.

Griffais et al teach a method of immunizing an animal comprising administering vaccine compositions comprising at least one *Chlamydia* antigen or antigenic fragment in an amount to induce an immune response (page 71-73). Graffais et al teach that the vaccine composition are administered to a mammalian host including humans (pages 72-73). Griffais et al teach that any number of antigens may be included in the invention (see Table 1). Griffais et al teach that antigen from *Chlamydia psittaci* may be included in the invention. Therefore, the prior art meets the claim limitation "...wherein the method is effective to induce an immune response against *Chlamydia psittaci*". The prior art teaches antigenic fragments of SEQ ID Nos. 7 and 9 (corresponding to the first *Chlamydia* antigen) as well as antigenic fragments of SEQ ID Nos. 13 (corresponding to the second *Chlamydia* antigen). SEQ ID NO: 59 of the prior

art correspond to fragments of SEQ ID NOs: 7 and 9. SEQ ID NO: 12 of the prior art correspond to fragments of SEQ ID NO:13. See the attached sequence alignments.

Since the Office does not have the facilities for examining and comparing applicant's method with the method of the prior art, the burden is on the applicant to show a novel or unobvious difference between the claimed method and the method of the prior art (i.e., that the method of the prior art does not possess the same material method steps and parameters of the claimed method). See In re Best, 562 F.2d 1252, 195 USPQ 430 (CCPA 1977) and In re Fitzgerald et al., 205 USPQ 594.

7. No claims are allowed.

Conclusion

8. Any inquiry of the general nature or relating to the status of this general application should be directed to the Group receptionist whose telephone number is (703) 308–0196.

Papers relating to this application may be submitted to Technology Center 1600, Group 1640 by facsimile transmission. The faxing of such papers must conform with the notice published in the Office Gazette, 1096 OG 30 (November 15, 1989). Should applicant wish to FAX a response, the current FAX number for the Group 1600 is (703) 872-9306.

Any inquiry concerning this communication from the examiner should be directed to Vanessa L. Ford, whose telephone number is (571) 272-0857. The examiner can normally be reached on Monday – Friday from 9:00 AM to 6:00 PM. If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Lynette Smith, can be reached at (571) 272-0864.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov./>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

Vanessa L. Ford
Biotechnology Patent Examiner
October 28, 2004

L. R. F. Smith
LYNETTE R. F. SMITH
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 1600